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# What is Known about Student Learning Outcomes and How does it relate to the Scholarship of Teaching and Learning?

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## **Keywords**

Student learning outcomes, Scholarship of teaching and learning, Theories of learning, Learning assessment, Accountability, Assessment methods, Student motivation and approaches

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## **What is Known about Student Learning Outcomes and How does it relate to the Scholarship of Teaching and Learning?**

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### **Abstract**

The purpose of this essay is to provide a broad review of topics relevant to the Scholarship of Teaching and Learning (SoTL). Sources from the international community have been utilized to provide summaries on the issues of assessment of student learning, accountability concerns, learning expectations, student motivation, and approaches to learning. Multiple theories of learning are discussed in relation to memory, cognition, constructionist viewpoint, self-defined reality, schemas, the mindful engagement of student learners, and the interplay of the learning environment and individual student characteristics. Each micro summary can be a potential building point for those new to SoTL as well as for its veterans.

## Growing Importance of Student Learning Outcomes

In recent decades, employers, parents, accrediting agencies, state legislators, the federal government, and students have begun to demand that post-secondary institutions be held more accountable for the education and training they provide to students (Albert, 1991; Eaton, 2003). "Student learning outcomes [SLOs] are rapidly taking center stage as the principal gauge of higher education's effectiveness" (Ruhland & Brewer, 2001, p. 142). Very few studies have empirically examined the impact of student learning outcomes (i.e., statements on learning expectations) on student learning and attitudes. As recent researchers have pointed out, "the (current popular) construct of student-centered learning appears to rely more on rhetoric than it does on evidenced-based pedagogical practice" (MacLellan & Soden, 2007, p. 4). The purpose of this essay is to provide a concise and integrative review of the theories on learning that can be used as a foundation for those in the scholarship of teaching and learning (SoTL) field. The review incorporates works from a wide domain of theorists (e.g., from Australia, Great Britain, Scotland, Ireland and the United States) and areas of specialization.

## Assessment and Accountability

One of the reasons learning outcomes are taking 'center stage' is because research on this topic asserts that learning is enhanced when students are made aware of the mastery expectations for their courses and degree programs (Appleby, 2003; Chappuis & Stiggins, 2002; Halonen, Appleby, Brewer, Buskist, Gillem, Halpern, Lloyd, Rudmann, and Whitlow, 2002; McKenney, 2003). Increasingly, colleges and universities are not only being asked to specify the learning expectations of their students, but to also provide evidence that those outcomes are being achieved (Allen & Bresciani, 2003; Crow, 2000; Wellman, 2000). Thus, the measure of success for institutions of higher education is not just in their enrollment and graduation rates, but also their documentation of student achievement of the learning outcomes associated with the degrees being awarded.

In order to better understand why there is a push for 'accountability' (i.e., meeting specified regional and federal standards) of student learning in post-secondary institutions, working definitions for 'student learning outcomes,' 'assessment,' and 'accountability' are needed. Student learning outcomes (SLOs) include the knowledge, skills, and dispositions (e.g., attitudes, beliefs, and attributes) that can be demonstrated by students as a result of their exposure to the educational environment (Entwistle, 1984). As noted by Jenkins & Unwin (1996, p. 2), the benefits associated with the use of SLOs are to

1. help students learn more effectively. They know where they stand, and the curriculum is made more open to them;
2. make it clear what students can hope to gain from following a particular course or lecture;
3. help instructors to design their materials more effectively by acting as a template for them;
4. help instructors select the appropriate teaching strategy;
5. help instructors more precisely to tell their colleagues what a particular [learning] activity is designed to achieve;

6. assist in setting examinations based on the materials delivered; and
7. ensure that appropriate assessment strategies are employed.

Ruhland and Brewer (2001) argue that learning outcomes should not only demonstrate what students know, but should also capture the changes that occur in their cognitive and affective development as a result of their college experiences (e.g., changes in critical thinking and level of civic mindedness). To address the accountability issues raised by employers, federal agencies, and parents, an institution must have the ability to demonstrate enhancement of student learning and development. Hence, the SoTL field can overlap with the activities associated with assessment and accountability.

On the other hand, some educational theorists postulate that the function of SLO statements is primarily to guide students' learning, which increases their ability to achieve each of the expected outcomes of the degree program (Banta, 1996). In other words, according to these theorists, students use the SLO statements as a means of focusing on the critical components of the course and to assist them in mastering skills and course content. An informed student (i.e., one who is given the SLOs) is more likely to achieve the expected outcomes than a student who is not informed. Given this connection between SLOs and students' academic development, inferences about student learning and progress can be drawn from the information gathered during the assessment process (Erwin, 1991 as cited in Wise, 2002). In other words, during the assessment process information can be obtained on how students interact with SLOs (for the course or degree program) along with their performance on measures of acquired knowledge. Therefore, according to Banta (1996) and Allen and Bresciani (2003), the use of SLOs serves two broad purposes: (a) to improve student learning and (b) to address the issue of institutional accountability.

Yet attaining these two objectives can be difficult because of a failure to recognize that the concepts of 'assessment' and 'accountability' represent different aspects of the review process. The word 'assessment' has several levels of meaning: 1) the methods used to measure learning; 2) the processes of administering measures and collecting information; 3) the process of interpreting and evaluating of the performance data; and 4) the process of making improvements based on the results of the data evaluated (e.g., Christopher Newport University Assessment Glossary, 2003; Leskes, 2002). Ruhland and Brewer (2001) state that, "[a]ssessment has been interpreted as a means to improving (a) student learning; (b) accountability for the quality of learning; (c) traditional and authentic measures of student learning; and (d) measures that show students have mastered the knowledge, skills, and abilities essential for employment" (p.146). Therefore, in some cases, assessment and accountability are tightly interwoven and there is a great tendency to confuse the process of 'assessment' with the documentation of 'evidence' or proof of student learning.

Experts in the field of assessment and student learning stipulate that assessment refers to the identification of expected outcomes as determined by the values of the faculty; the selection of methods for measuring thoughts, behaviors, and feelings associated with outcome statements; the design or plan for administering the measures; and the recommendations formulated by faculty after they have reviewed the information collected (Palomba & Banta, 1999). Evaluation of the assessment data is only one part of the process of improving student learning, in which the results are compared to standards created by the faculty. When standards are used to interpret data, then the focus has shifted from discovering what students know (i.e., assessment) to an evaluation of the quality of what students know (i.e., accountability). As an example, assume that an assessment data set indicates that 80% of the students in an advanced social psychology

course scored at least 70 points (out of 100 points) on a cumulative final. The 'assessment' components include the tool (cumulative exam) used to measure students' competencies within the course and the score they obtain on the assessment tool. The 'evaluation' component of the assessment process occurs when faculty members interpret the desirability of the assessment results by asking themselves, "Do the results demonstrate an acceptable level of performance by our majors within this course?"

### **Assessment Measures and Approaches**

Regardless of the evaluation and application of assessment results, the 'proof' or evidence is only as good (e.g., reliable and valid) as the measures being used (Jenkins & Unwin, 1996; Lopez, 1996). Data derived from poorly constructed or inappropriate assessment measures can invalidate the results and invalidate the generalizations that can be made about student learning in the course or degree program (i.e., provide misleading or incorrect information). Therefore, "proof" or evidence of student learning for the purpose of improvement and accountability is heavily dependent upon the types of measures used to assess learning. As recommended by experts in the field (Angelo, 1999; Dietel, Herman, & Knuth, 1991; Huba & Freed, 2000; Maki, 2002; Palomba & Banta, 1999), multiple assessment measures should be utilized in order to obtain a clearer understanding of what students have learned and to compensate for biases or weaknesses in any single assessment instrument.

In addition to choosing multiple assessment measures, assessment leaders have recommended that teachers and administrators identify the levels at which learning outcome statements are examined (i.e., identifying the course, program, college, or university level of assessment). The purpose for assessing different levels within the institution may vary depending upon the mission, values, and goals of each unit within the institution. For example, university-wide assessment might focus on broad educational objectives such as civic responsibility and attitudes toward life-long learning, whereas course-level assessment might concentrate on very specific objectives such as identifying the major behavioral characteristics that are associated with self-understanding or civic responsibility. Thus, more encompassing goals (e.g., general education) or units (e.g., the College of Arts and Sciences) will typically involve several levels within an institution as compared to the assessment of specific learning expectations with a given major. A 'one size fits all' approach does not produce effective or sustainable outcomes, especially when large differences exist in the values, missions, or purposes within institutions of higher education.

An advantage to course-level assessment is that it can provide greater flexibility and more opportunities to discover whether students are achieving certain learning outcomes (Angelo, 1999). The program and university levels of assessment typically occur close to students' graduation. Assessment information gathered *only* at the end-point makes the evaluation process problematic, because areas for improvement in the educational program are difficult to pinpoint. For example, it is often unclear at what point in the curriculum changes should be made in order to improve student learning. In order to examine this issue, some educational researchers recommend assessing the stated learning outcomes throughout the learning experience (i.e., at the beginning, middle, and end of the academic program) (Lopez, 1996). An alternative method of pinpointing when students can successfully demonstrate their knowledge, skills, and attitudes, is to use assessment measures at critical milestones within the major (Palomba & Banta, 1999).

The ability to draw accurate conclusions and inferences about student achievement of expected outcomes is directly related to the measures and methods used during the assessment process; poor methods and instruments can lead to unreliable results and

misleading conclusions. At some institutions, funding is directly tied to assessment results (Allen & Bresciani, 2003; Benjamin, 1990); therefore, addressing measurement issues becomes even more critical. Because the assessment of SLOs is the foundation from which some institutions build their evidence of student learning, teachers and administrators should think about: 1) how adequate (valid) their assessment measures are in relation to the SLOs being assessed; 2) whether the identified SLO statements are what they value as a department, college, or university; and 3) what level of the institution is most appropriate for implementing assessment strategies, such as at the course-level or at the university-level.

Improving awareness of the methodological issues that affect assessment activities, plans, and processes is just one of many starting points for faculty and administrators. The educational values a department and institution possess become another initiating point for examining the assessment of student learning within higher education. Educational values may be more adequately understood by reviewing some of the theoretical background behind the study of learning and its associated processes.

### **Theories of learning**

Entwistle (1984) describes the earliest attempts by psychologists to define learning and the mechanisms involved with memory. He discusses William James' (early 1900s) approach to learning, which emphasized the importance of associations between pieces of information and that such connections are the driving force behind what is remembered. In other words, we remember things because they are connected to information we already know or possess. The tighter or closer the association between pieces of information, the easier they will be to remember.

Entwistle (1984) also describes the information processing model of memory, a computer-based model of how people learn. The model stipulates that memory (i.e., learning) occurs by focusing attention on stimuli and then properly encoding the stimuli into the brain (i.e., successfully storing the information or stimuli). Memory, or the evidence of learning, occurs when information is successfully retrieved from storage. New information is grouped into conceptual hierarchies (Lindsay & Norman, 1972 cited in Entwistle, 1984), described as "logically ordered sets of concepts, stored in terms of increasing generality" (Entwistle, 1984, p. 8). These conceptual sets eventually form broad-spectrum categories for sorting and storing new information. The logical grouping of information is very similar to James' emphasis on associations between bits of information. Forgetting, or the loss of association, is attributed to encoding problems, faulty or incomplete storage, or retrieval difficulties. The model suggests that techniques for improving learning are similar to those for enhancing general memory. That is, improvement is related to how information is placed into storage and how cues are used to pull the information out of storage.

Modern theories of learning build upon the information processing model of memory. However, critics of this model (e.g., Ausubel, Novak, & Hanesian, 1978 as cited in Entwistle, 1984) and of the conceptual hierarchies idea, argue that both approaches are too limiting and only account for the processing of concrete concepts (Entwistle, 1984). Abstract concepts, which tend to involve information from a variety of categories or generalities, do not follow the encoding process described by Lindsay and Norman (1972). Because of these limitations, other theorists (Ausubel et al. (1978) and Rogers (1969) in Entwistle, 1984) have modified the theory behind the information processing model by describing learning as the process of constructing meaning. Abstract concepts cannot be added into memory like adding another link in a chain. Instead, abstract concepts require people to actively connect new information to prior knowledge and experiences that have both shared and unique information. The links of information are no longer conceptualized as a single horizontal

chain but as a three-dimensional network of interlinked connections (Entwistle, 1984); sometimes also described as fuzzy networks.

Dietel, Herman, and Knuth's (1991) more recent review conveys a similar message that learning is no longer thought of as a linear or block building process as implied by previous learning models (e.g., Skinner's operant conditioning and Piaget's stages of cognitive development). Instead, they describe learning as occurring in "... many directions at once and at an uneven pace" (Dietel et al., 1991, p. 4). Biggs' (1987) appraisal of the student learning literature suggests that the learning context and what students find meaningful within that context influence the rate and speed at which new knowledge is acquired; "... learning varies according to its content and nature, and more subtly, in the way students perceive their performance, its importance to them, and what constitutes an acceptable level of performance to them" (p. 2).

### **Meaning and the Social Construction of Reality**

Comparable to the importance of focused attention on initiating the learning process, "meaning" also plays a vital role in regulating what people remember. What is meaningful is very individualized, but prior knowledge and information about the self are two key sources of meaning for most people (Entwistle, 1984). Marton and Säljö's (1984) research on student learning and performance suggests that information is more likely to be learned and remembered if the learner deems it personally relevant and meaningful. The importance of meaning harkens back to James' emphasis on associations between what people know and what they are currently experiencing. Our understanding of reality, according to James, is constantly changing as we experience novel situations; "[a]s experience grows, reality grows, and it is experience that contributes meaningful additions and alternative ways of seeing reality" (Viney, King, & King, 1992, p. 93).

Other researchers (e.g., Markus & Sentis, 1982) have examined different aspects of the relationship between learning and individuals' socially constructed view of reality. For example, new information is filtered through individuals' cognitive schemas, which relate information to the self or social situations. "The self-structure [or self-schemata] can shape social interaction in at least two ways. Firstly, it influences how information about the self and others is handled (i.e., encoded, categorized, monitored, retrieved, stored, and evaluated). Secondly, it determines the type and nature of information about the self that will be managed and presented to others in the course of a social interaction" (Markus & Sentis, 1982, p. 60). Thus, learning within the classroom can be influenced by how students relate new information to themselves and how their understanding of the course material is presented by others within the class (e.g., differences emerging in peer vs. instructor-led discussions). The connections between learning, the self, and the construction of reality are further explored in the writings of George Herbert Mead.

Barnes' (2002) review, of George Herbert Mead's (1934) work consisting of a collection of notes, letters, and journal, indicated that Mead thought that reality is constructed as a byproduct of the development of the self. In other words, the self develops through a process in which the individual's conscious awareness (i.e., the psychical) is activated by the social situations he/she engages in with others. Without conscious (i.e., psychical energy) engagement, the self stops developing; learning and growth do not occur. As Mead's theory contends, "[t]he growth of the self arises out of a partial disintegration—the appearance of the different interests in the form of reflection, the reconstruction of the social world and the consequent appearance of the new self that answers to the new object" (Barnes, 2002, p. 56). The problems for which we seek answers arise when we encounter situations or new information that conflicts with our prior feelings, thoughts, and beliefs.



Such encounters cause us to engage in self reflection and the contemplation of our values, from which our sense of self may be reconstructed to integrate what we have learned from this process. Thus, self-development and learning are on-going and dynamic processes.

In addition, Mead argued that people must be motivated to seek out solutions to the problems they face; without such motivation, the determination to learn fades away. Stated another way, "... the conscious and psychical self simply is not even present unless there is some genuine problem [relevant to the individual]. In short, where there is no engagement and no attention, there is no student. And, consequently, there is no learning" (Barnes, 2002, p. 57). Langer's (1978) work on mindlessness suggests that the will to think about our actions is greatly reduced when the reasons for our mindful engagement are removed. By taking away the problems or relevance of the information, the individual's level of mindfulness is reduced to a state of merely performing automatic and habitual behaviors (i.e., mindlessly playing out rehearsed scripts). Applied to education, the loss of engagement by students within the classroom may be compounded by the removal of what they find meaningful. When students' interests in course material are removed (or not present to begin with), engagement in the learning process (i.e., presence of the psychical) may be severely impaired, leaving students with little more than the rehearsed behaviors typically seen in classrooms (e.g., the use of a surface approach to learning and an inhibited ability to apply information outside the classroom).

Dahlgren's (1984) ideas about the relevance of information to the individual seem to agree with James' and Mead's descriptions of reality. More specifically, learning and meaning are interconnected; "[to] learn is to strive for meaning, and to have learned something is to have grasped its meaning" (pp. 23-24). Humans are dependent upon their ability to construct their own reality and are driven to use meaning as a way of understanding the reality they have created. Meaning is created and reshaped based on how people interpret and reinterpret what they have learned. "The first step in change among students may be their ability to correctly utilize the specialization's [i.e., discipline or profession] terminology to describe phenomenon. Later, or the next stage, may be to progress to a higher level of understanding beyond just the use of terminology" (Dahlgren, 1984, p. 31).

For example, the purpose and reasons (i.e., meaning) behind why a student learns about business administration will change depending on how the business-related knowledge and skills are applied to her life. Passing the general business class will provide one type of meaning (e.g., learning the material was meaningful because it helped her to pass the course) whereas applying her business knowledge to her start-up company will provide a new type of meaning. This new meaning for why she took the general business course results from a reinterpretation of the usefulness of the business knowledge as applied to the current situation (e.g., the daily operations of her company as opposed to doing well in the course). In sum, when asked why her undergraduate course in general business was meaningful, she is more likely to report the latest application of her skills as the reason.

Another practical application of the changing perception of reality is seen in Entwistle's (1984) review of William Perry's (1970, 1981) clinical work as a student counselor. While at Harvard University, Perry was very interested in studying how students' intellectual and ethical development changed within the college setting. He discovered that students' thinking underwent a qualitative transformation during their years in college. For example, new students would typically report that all questions had a simple answer or a precise solution that was either correct or incorrect as determined by an expert (e.g., teacher or parent). By the time students were graduating, their thinking had changed so that they believed that few questions or problems had simple solutions, especially for real life problems.

Both James and Mead might argue that the experiences these students encountered, over the course of four years, changed the way they perceived reality. In Mead's (1964) viewpoint, the purpose of higher education should be about learning how to learn and "... not merely ingesting something pre-given" (as cited in Barnes, 2002, p. 56). In other words, facts in and of themselves do not help people to solve problems, people need to know how to seek out and evaluate information in order to adjust to everyday problems that they face in a variety of social situations. Thus, students who are geared more toward the process of learning (i.e., "learning to learn") and not just the memorization of facts, are better prepared and more likely to succeed in addressing frequent and unpredictable problems that occur throughout one's lifetime (Barnes, 2002). The college experience can help people develop alternative viewpoints that may have a profound affect on their view of reality.

There appears to be strong connections between meaningfulness, learning, self-development, and the social construction of reality. In theory, students are more likely to achieve the stated learning outcomes when they are able to connect course and program material to something they find meaningful, such as connecting new information to an aspect of their self-concept or to their prior knowledge (Dahlgren, 1984; Markus & Sentis, 1982; Marton & Säljö, 1984). Students may also be more capable of demonstrating their competency when asked to present their understanding in a meaningful way, such as asking a pre-med major in a general psychology course to describe the physiological mechanisms that are activated when a person experiences a psychological stressor.

Although there may be a direct relationship between meaningfulness and learning, the uniqueness of reality and peoples' idiosyncratic tendencies makes this relationship complex and challenging to predict. This difficulty is especially evident when trying to capture or predict what students learn. As suggested by Marton and Säljö (1984), "[if] the outcome of learning differs between individuals, then the very process of learning which leads to different outcomes must also have differed between individuals" (p. 37). In other words, there is an interaction between students and their learning environment that results in the differential achievement of expected outcomes. If researchers and educators want to better understand and predict what students are learning, then they need to examine not only what students find meaningful (measures of uniqueness) but also (1) the motivation students have toward learning and achieving the expected outcomes, (2) the characteristics of the learning environment (e.g., teacher effectiveness) that influence motivation, and (3) student perceptions of the meaningfulness of the course material.

### **Learning Motivation and Approaches**

Student motivation and approaches to learning have an impact not only on student academic performance but also on attitudes toward studying (Ramsden & Entwistle, 1981; Entwistle & Ramsden, 1983). Student motivation is typically described as intrinsic (i.e., being motivated by internally generated rewards such as self-enhancement or satisfying one's curiosity) or extrinsic (i.e., being motivated by externally derived rewards such as praise from a teacher or achieving the highest grade in the course). Although student motivation is consistently mentioned within the literature (e.g., Marton & Säljö, 1984; Ramsden, 1984), there are different ways of describing various approaches to learning. The main difference is related to whether the approach is derived from the student (i.e., stable traits or tendencies) or derived from the learning environment (i.e., different situations eliciting different approaches). There has been growing agreement that the major differences involve either deep or surface approaches to learning. The deep approach refers to tendencies to look for or construct the meaningfulness of information, and the purposeful intention of wanting to understand the information (Marton & Säljö, 1984). The surface

approach typically steers away from understanding and instead focuses on the ability to memorize the pieces that make up the information (Marton & Säljö, 1984).

According to Marton & Säljö's (1984) and Ramsden's (1984) review of the literature on learning orientation, students utilized both deep and surface approaches when studying, but individuals displayed consistent preferences or tendencies. They either focused on reinterpreting information in a personally meaningful way ("meaning orientation") or they concentrated on specific facts, details, and pieces of information ("reproducing orientation") (p. 158). The "meaning orientation" is conceptually similar to the deep approach and the "reproducing orientation" with the surface approach. This suggests that the orientation terminology is based on the premise of stable traits, whereas the approach terminology assumes an interaction with the learning environment.

In the same literature review, Ramsden points out that a student's study orientation is changeable, that is, "... just as students change their conceptions of learning over time, so they may shift their study orientation during a programme of higher education" (p. 158). Gibbs, Morgan, and Taylor (1984) also concur, saying that "Orientation does not assume any state or trait belonging to the student; it is a quality of the relationship between the student and the course rather than a quality inherent in the student and so may change over time" (p. 169). In sum, there continues to be evidence for both stable individual tendencies and the learning environment as predictors of student learning behaviors. Nonetheless, the reviews presented in the following sections strongly imply that the environment may play a more dominant role, than personal dispositions, in student motivation for and orientation toward learning.

### **Demands of the Learning Environment.**

Hodgson's (1984) review of the learning literature asserts that "[l]earning does not take place in a vacuum, but in various social contexts" (p. 101). The strategies, techniques, or approaches that students use can be shaped by the demands (e.g., assignments and tests) placed upon them within the learning context. Thus, motivation to learn can be narrowed by the types of demands placed upon students. For example, motivation to learn may be directed by only those pieces of information that are needed for a test (Hodgson, 1984). Others argue that the reverse can also occur (i.e., enhancement of learning and understanding) when techniques within the social learning context are used to encourage self-reflective assessment, to increase enthusiasm for course material, or to train students to use more deep approaches to learning (Hodgson, 1984; Hounsell, 1984a,b; Marton & Säljö, 1984; Tuckman, 2001).

Approaches to learning have also been linked with levels of student motivation (Entwistle, 1984). In many cases, these two sets of terms are interchangeable, such that, intrinsic motivation and the deep approach are connected, and extrinsic motivation is associated with the surface approach to learning (Briggs, 1987; Entwistle & Ramsden, 1983; Garrison, Andrews, & Magnusson, 1995; Marton & Säljö, 1984). Hence, students who utilize a deep approach are considered to be intrinsically motivated about learning (e.g., internal or self-selected rewards) and tend to look for or create meaning out of new information as a means of integrating it with their prior knowledge or understanding of the world. By contrast, students who use the surface approach tend to engage in rote memorization and regurgitation of pieces of information for extrinsically motivated reasons, such as seeking higher grades, monetary gain, or increased praise from authority figures (Garrison, Andrews, & Magnusson, 1995). The issue of whether student motivations are stable traits, "... which are the habitual forms of satisfaction derived by different people from their

experiences of learning" (Entwistle, 1984, p.7), or a consequence of the students' learning environment, is still heavily debated (Marton & Säljö, 1984; Ramsden, 1984).

### Conclusion

The purpose of this essay was to provide an integrated summary of the literature that touches upon many of the issues faced by those in the SoTL field. The major topics discussed include overlaps between SoTL and the assessment of student learning outcomes, methodological issues that impact learning research, multiple theories of learning (e.g., self, personality, motivation and the learning environment), approaches to learning taken by students, and the interactions across these key areas. Each topic summary reveals a foundation from which to build more inclusive theories of teaching and learning, or for developing ways to empirically test the "rhetoric" that may exist within the literature. The self-oriented literature may be especially of interest to those examining student development issues within SoTL or within student affairs. Although the essay provides some international coverage, a broader range of countries from the international community and different cultural perspectives on student learning are still needed.

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